POSTER EXPOSITION

UNIVERSITY OF LEICESTER

Poster 8

Numerical modelling of thermal-mechanical evolution during high heat input welding of marine steel

Jun Fu

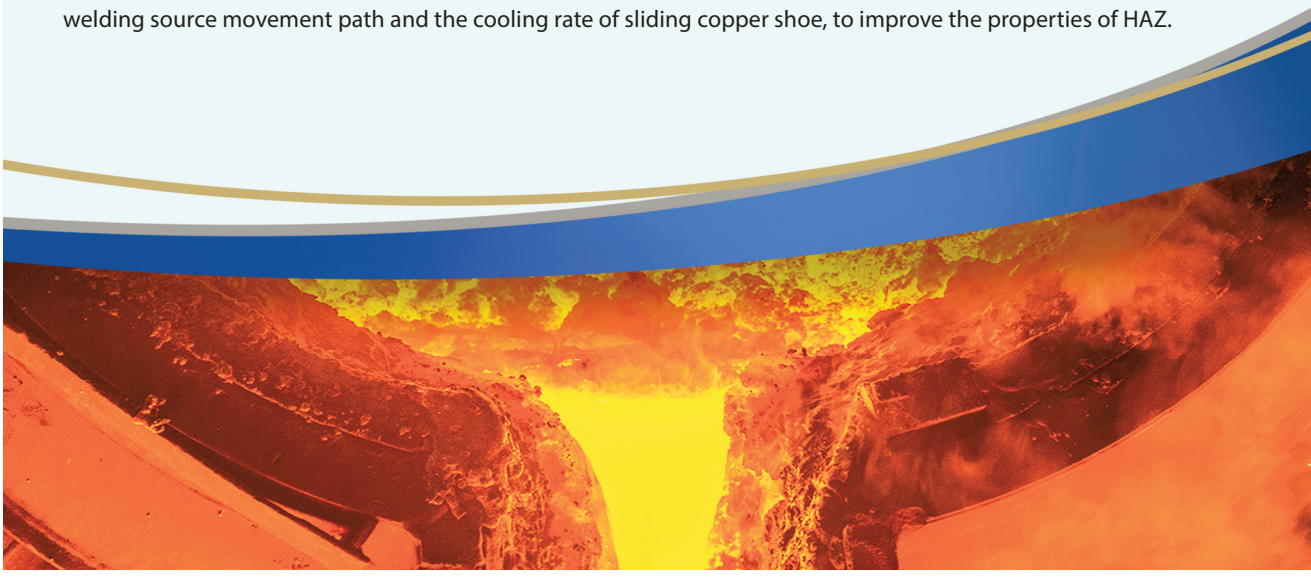
AUTHOR OF POSTER:
Jun Fu

INSTITUTION:
University of Leicester

OTHER AUTHORS:
Qing Tao, University of Leicester
Nenchev Bogdan, University of Leicester
Dr Chinnapat Panwiswas, University of Leicester
Ming Li, NISCO Research Institute, NISCO, China
Biao Tao, NISCO Research Institute, NISCO, China
Professor Hongbiao Dong, University of Leicester

ABSTRACT:
The high heat input welding method can improve the efficiency of manufacturing, but the impact toughness of heat-affected zone (HAZ) is reduced seriously during the welding process. Thermal profile evolution in HAZ is the key factor affect microstructures and resulting mechanical properties of welded joints.

In this study, we coupled heat transfer, solid mechanics and solid-state evolution to simulate the electro-gas welding (EGW) process of ultra-high strength marine steel plate using COMSOL multiphysics software. The real welding geometry, process variables and materials are used with a three-dimension heat source as a sinusoidal function with various heat input up to 200kJ/cm. The simulation results reveal that microstructure can be optimized by varying the welding source movement path and the cooling rate of sliding copper shoe, to improve the properties of HAZ.



Organised by:

Materials Processing Institute

ARMOURERS & BRASIERS' COMPANY

I·M3

Associate Sponsor:

M2A COATED www.M2A.wales

PRISM